INTRODUCTION

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STRING MATCHING WITH FINITE AUTOMATA:

- String matching algorithm builds a finite automaton
- A simple machine for processing information that scans the text string T for all occurrences of the pattern P

FINITE AUTOMATA…

FINITE AUTOMATA

- A ***finite automaton*** M, is a 5 tuple(Q, q_o, A, Σ, δ) ,where
- Q is finite set of ***states***,
- $q_o \epsilon$ Q is the start ***state,***
- A ⊆Q
- is a distinguished set of ***accepting states,***
- Σ is a finite ***input alphabet,***
- δ is a function from Q× Σ into Q, called the ***transition function*** of M.

STRING MATCHING WITH FINITE AUTOMATA…

MATCHING AUTOMATA (SUFFIX Function)

The String Matching automata corresponding to a given pattern P[1…m]

- An auxiliary function σ, called the suffix function corresponding to P
- The function σ maps Σ* to {0,1,…..,m} such that σ(x) is the length of the longest prefix of P that is also a suffix of x:
- $\sigma(x) = \max\{k: P_k \sqsupset x\}$

ALGORITHMS…

COMPUTE TRANSITION FUNCTION:

COMPUTE-TRANSITION-FUNCTION(P,Σ)

1.m-P.length

2.for q=0 to m

3. for each character a ϵ Σ

4. k= min(m+1,q+2)

5. repeat

6. K=k-1

7. until P k ⊐ P q a

8. δ(q ,a)=k

9.return δ

DRY RUNNING…

COMPUTE TRANSITION FUNCTION:

- TEXT=abababacaba
- PATTERN=ababaca
- Σ={a,b,c}

Compute transition function(P,Σ)

1. m← length[P]
   m← 7
2. for q←0 to m
   for q←0 to 7
3. do for each character aϵΣ

// Σ={a,b,c}

1st ITERATION:

q=0, a=a

3. for each character aϵa

4. k←min(m+1,q+2)

= min(7+1,0+2)=2

K←2

7. Pk ⊐ Pqa= P2⊐P0a

(ab⊐a) FALSE

K←1

7.Pk ⊐ Pqa= P1⊐P0a

(a⊐a) TRUE

8.δ(q,a)←k

δ(0,a)←1

state	a	b	c	P
0	1			a
1				b
2				a
3				b
4				a
5				c
6				a
7				

CONT...

q=0

3. for each character aϵb

4. K=2

7. Pk ⊐ Pqa=P2⊐P0a

(ab⊐b) FALSE

K=1

7.Pk ⊐ Pqa=P1⊐P0a

(a⊐b) FALSE

K=0

Pk ⊐ Pqa=P0⊐P0b

(ϵ ⊐b) TRUE

8.δ(q,a)←k

δ(0,b)←0

state	a	b	c	P
0	1	0		a
1				b
2				a
3				b
4				a
5				c
6				a
7				

CONT...

q=0

3. for each character aϵc

4. K=2

7. Pk ⊐ Pqa=P2⊐P0a

(ab⊐c) FALSE

K=1

7.Pk ⊐ Pqa=P1⊐P0a

(a⊐c) FALSE

K=0

Pk ⊐ Pqa=P0⊐P0s

(ϵ ⊐c) TRUE

8.δ(q,a)←k

δ(0,c)←0

state	a	b	c	P
0	1	0	0	a
1				b
2				a
3				b
4				a
5				c
6				a
7				

2nd ITERATION:

2.for q←1 to 7

3.for each character aϵ(a,b,c)

q=1,a=a

4.k←min(m+1,q+2)=min(7+1,1+2)=3

K←3

Pk ⊐ Pqa=P3⊐P1a=(aba⊐aa) FALSE

k←2

7. Pk ⊐ Pqa=P2⊐P1a

(ab⊐aa) FALSE

K=1

7.Pk ⊐ Pqa=P1⊐P1a

(a⊐aa) TRUE

8.δ(q,a)←k

δ(1,a)←1

State	a	b	c	P
0	1	0	0	a
1	1			b
2				a
3				b
4				a
5				c
6				a
7				

CONT...

q=1
for each character aϵb
4.K←3

Pk ⊐ Pqa=P3⊐P1a=(aba⊐ab)
FALSE
k←2
7. Pk ⊐ Pqa=P2⊐P1a
(ab⊐ab) TRUE
8.δ(1,b)←2

State	a	b	c	P
0	1	0	0	a
1	1	2		b
2				a
3				b
4				a
5				c
6				a
7				

CONT...

q=1
for each character aϵc
4.K←3

Pk ⊐ Pqa=P3⊐P1a=(aba⊐ac) FALSE
k←2
7. Pk ⊐ Pqa=P2⊐P1a
(ab⊐ac) FALSE
k←1
Pk ⊐ Pqa=P1⊐P1a
(a⊐ac) FALSE
k←0
Pk ⊐ Pqa=P0⊐P1a
(ϵ⊐ac) TRUE
8.δ(1,c)←0

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2				a
3				b
4				a
5				c
6				a
7				

3rd ITERATION:

2.for q←2 to 7
3.for each character aϵ(a,b,c)
q=2,a=a
4.k←min(m+1,q+2)=min(8,4)=4
K←4

Pk ⊐ Pqa=P4⊐P2a=(abab⊐aba)
FALSE
Pk ⊐ Pqa=P3⊐P2a=(aba⊐aba)
TRUE
8.δ(q,a)←k
δ(2,a)←3

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3			a
3				b
4				a
5				c
6				a
7				

CONT...

q=2

for each character aϵb

K←4

Pk ⊐ Pqa=P4⊐P2a=(abab⊐abb)

FALSE

K=3

Pk ⊐ Pqa=P3⊐P2a=(aba⊐abb)

FALSE

k←2

7. Pk ⊐ Pqa=P2⊐P2a =(ab⊐abb)

FALSE

K=1

7.Pk ⊐ Pqa=P1⊐P2a

(a⊐abb) FALSE

K=0

7.Pk ⊐ Pqa=P0⊐P2a

(ϵ⊐abb)TRUE

8.δ(q,a)←k

δ(2,b)←0

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0		a
3				b
4				a
5				c
6				a
7				

CONT...

q=2
for each character aϵc

K←4

Pk ⊐ Pqa=P4⊐P2a=(abab⊐abc)
FALSE

K=3

Pk ⊐ Pqa=P3⊐P2a=(aba⊐abc)

FALSE

k←2

7. Pk ⊐ Pqa=P2⊐P2a =(ab⊐abc)
FALSE

K=1

7.Pk ⊐ Pqa=P1⊐P2a

(a⊐abc) FALSE

K=0

7.Pk ⊐ Pqa=P0⊐P2a

(ϵ⊐abc)TRUE

8.δ(q,a)←k

δ(2,c)←0

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3				b
4				a
5				c
6				a
7				

4TH ITERATION:

2.for q←3 to 7

3.for each character aϵ(a,b,c)

q=3,a=a

4.k←min(m+1,q+2)=min(8,4)=4

K←5

Pk ⊐Pqa=P5⊐P3a=(ababa⊐abaa)

FALSE

k←4

Pk ⊐Pqa=P4⊐P3a=(abab⊐abaa)

FALSE

K←3

Pk ⊐Pqa=P3⊐P3a=(aba⊐abaa)

FALSE

k←2

Pk ⊐Pqa=P2⊐P3a=(ab⊐abaa)

FALSE

K←1

Pk ⊐Pqa=P1⊐P3a=(a⊐abaa)

TRUE

8.δ(q,a)←k

δ(3,a)←1

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1			b
4				a
5				c
6				a
7				

CONT...

2.for q←3
3.for each character aϵb
K←5
Pk
⊐Pqa=P5⊐P3a=(ababa⊐abab)
FALSE
k←4
Pk ⊐Pqa=P4⊐P3a=(abab⊐abab)
TRUE
8.δ(q,a)←k
δ(3,b)←4

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4		b
4				a
5				c
6				a
7				

CONT...

2.q=3
3.for each character aϵc

K←5

Pk ⊐Pqa=P5⊐P3a=(ababa⊐abac)
FALSE

k←4
Pk ⊐Pqa=P4⊐P3a=(abab⊐abac)

FALSE

K←3

Pk ⊐Pqa=P3⊐P3a=(aba⊐abac)
FALSE

k←2
Pk ⊐Pqa=P2⊐P3a=(ab⊐abac)

FALSE

K←1
Pk ⊐Pqa=P1⊐P3a=(a⊐abac)

FALSE

K←0
Pk ⊐Pqa=P0⊐P3a=(ϵ⊐abac)

TRUE

8.δ(q,a)←k
δ(3,c)←0

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4				a
5				c
6				a
7				

5th ITERATION:

2.for q←4to 7
3.for each character aϵ(a,b,c)
q=4,a=a
4.k←min(m+1,q+2)=min(8,6)=6
K←6
Pk ⊐Pqa=P6⊐P4a=(ababac⊐ababa)
FALSE
K←5
Pk ⊐Pqa=P5⊐P4a=(ababa⊐abaBA)
TRUE
8.δ(q,a)←k
δ(4,a)←5

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5			a
5				c
6				a
7				

CONT...

2.q=4
3.for each character aϵb
K←6
Pk ⊐Pqa=P6⊐P4a=(ababac⊐ababb)
FALSE
K←5
Pk ⊐Pqa=P5⊐P4a=(ababa⊐ababb)
FALSE
k←4
Pk ⊐Pqa=P4⊐P4a=(abab⊐ababb)
FALSE
K←3
Pk ⊐Pqa=P3⊐P4a=(aba⊐ababb)
FALSE
k←2
Pk ⊐Pqa=P2⊐P4a=(ab⊐ababb)
FALSE
k←1
Pk ⊐Pqa=P2⊐P4a=(a⊐ababb)
FALSE
k←0
Pk ⊐Pqa=P2⊐P4a=(ϵ⊐ababb)
TRUE
8.δ(q,a)←k
δ(4,b)←0

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0		a
5				c
6				a
7				

CONT...

2.q=4

3.for each character aϵc

K←6

Pk ⊐Pqa=P6⊐P4a=(ababac⊐ababc)

FALSE

K←5

Pk ⊐Pqa=P5⊐P4a=(ababa⊐ababc)

FALSE

k←4

Pk ⊐Pqa=P4⊐P4a=(abab⊐ababc)

FALSE

K←3

Pk ⊐Pqa=P3⊐P4a=(aba⊐ababc)

FALSE

k←2

Pk ⊐Pqa=P2⊐P4a=(ab⊐ababc)

FALSE

k←1

Pk ⊐Pqa=P2⊐P4a=(a⊐ababbc

FALSE

k←0

Pk ⊐Pqa=P2⊐P4a=(ϵ⊐ababc)

TRUE

8.δ(q,a)←k

δ(4,c)←0

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0	0	a
5				c
6				a
7				

6th ITERATION:

2. for q←5to 7

3. for each character aϵ(a,b,c)

q=5,a=a

4. k←min(m+1,q+2)=min(8,7)=7

K←7

Pk ⊐Pqa=P7⊐P5a=(ababaca⊐ababaa)

FALSE

K←6

Pk ⊐Pqa=P6⊐P5a=(ababac⊐ababaa)

FALSE

K←5

Pk ⊐Pqa=P5⊐P5a=(ababa⊐ababaa) FALSE

k←4

Pk ⊐Pqa=P4⊐P5a=(abab⊐ababaa)

FALSE

K←3

Pk ⊐Pqa=P3⊐P5a=(aba⊐ababaa) FALSE

k←2

Pk ⊐Pqa=P2⊐P5a=(ab⊐ababaa)

FALSE

k←1

Pk ⊐Pqa=P2⊐P4a=(a⊐ababbaa

TRUE

8. δ(q,a)←k

δ(5,a)←1

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0	0	a
5	1			c
6				a
7				

CONT...

4.q←5

3.for each character aϵb

K←7

Pk ⊐Pqa=P7⊐P5a=(ababaca⊐abababab)

FALSE

K←6

Pk ⊐Pqa=P6⊐P5a=(ababac⊐abababab)

FALSE

K←5

Pk ⊐Pqa=P5⊐P5a=(ababa⊐abababab)

FALSE

k←4

Pk ⊐Pqa=P4⊐P5a=(abab⊐abababab)

TRUE

8.δ(q,a)←k

δ(5,b)←4

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0	0	a
5	1	4		c
6				a
7				

CONT...

4.q←5

3.for each character aϵc

K←7

Pk ⊐Pqa=P7⊐P5a=(ababaca⊐ababac)

FALSE

K←6

Pk⊐Pqa=P6⊐P5a=(ababac⊐ababac)

TRUE

8.δ(q,a)←k

δ(5,c)←6

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0	0	a
5	1	4	6	c
6				a
7				

7TH ITERATION:

2.for q←6to 7
3.for each character aϵ(a,b,c)
q=6,a=a
4.k←min(m+1,q+2)=min(8,8)=8
K←8
Pk ⊐Pqa=P8⊐P6a=(ababacaa⊐ababaca)
FALSE
K←7
Pk ⊐Pqa=P7⊐P6a=(ababaca⊐ababaca)
TRUE
8.δ(q,a)←k
δ(6,a)←7

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0	0	a
5	1	4	6	c
6	7			a
7				

CONT...

2.q←6

3.for each character aєb

K←8

Pk ⊐Pqa=P8⊐P6a=(ababacaa⊐abababacb) FALSE

K←7

Pk ⊐Pqa=P7⊐P6a=(abababaca⊐abababacb) FALSE

K←6

Pk ⊐Pqa=P6⊐P6a=(abababac⊐abababacb) FALSE

K←5

Pk ⊐Pqa=P5⊐P6a=(ababa⊐abababacb) FALSE

K←4

Pk ⊐Pqa=P4⊐P6a=(abab⊐abababacb) FALSE

K←3

Pk ⊐Pqa=P3⊐P6a=(aba⊐abababacb) FALSE

K←2

Pk ⊐Pqa=P2⊐P6a=(ab⊐abababacb) FALSE

K←1

Pk ⊐Pqa=P1⊐P6a=(a⊐abababacb) FALSE

K←0

Pk ⊐Pqa=P0⊐P6a=(є⊐abababacb) TRUE

8.δ(q,a)←k

δ(6,b)←0

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0	0	a
5	1	4	6	c
6	7	0		a
7				

CONT...

2.q←6
3.for each character aϵc
K←8
Pk ⊐Pqa=P8⊐P6a=(ababacaa⊐ababac) FALSE
K←7
Pk ⊐Pqa=P7⊐P6a=(ababaca⊐ababac) FALSE
K←6
Pk ⊐Pqa=P6⊐P6a=(ababac⊐ababac) FALSE
K←5
Pk ⊐Pqa=P5⊐P6a=(ababa⊐ababac) FALSE
K←4
Pk ⊐Pqa=P4⊐P6a=(abab⊐ababac) FALSE
K←3
Pk ⊐Pqa=P3⊐P6a=(aba⊐ababac) FALSE
K←2
Pk ⊐Pqa=P2⊐P6a=(ab⊐ababac) FALSE
K←1
Pk ⊐Pqa=P1⊐P6a=(a⊐ababac) FALSE
K←0
Pk ⊐Pqa=P0⊐P6a=(ϵ⊐ababac) TRUE
8.δ(q,a)←k
δ(6,c)←0

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0	0	a
5	1	4	6	c
6	7	0	0	a
7				

8TH ITERATION:

2.q←7 to 7

3.for each character aϵ(a,b,c)
q=7,a=a

4.k←min(m+1,q+2)=min(8,9)=8

K←8

Pk ⊐Pqa=P8⊐P7a=(ababacaa⊐ababacaa) FALSE

K←7

Pk ⊐Pqa=P7⊐P7a=(ababaca⊐ababacaa) FALSE

K←6

Pk ⊐Pqa=P6⊐P7a=(ababac⊐ababacaa) FALSE

K←5

Pk ⊐Pqa=P5⊐P7a=(ababa⊐ababacaa) FALSE

K←4

Pk ⊐Pqa=P4⊐P7a=(abab⊐ababacaa) FALSE

K←3

Pk ⊐Pqa=P3⊐P7a=(aba⊐ababacaa) FALSE

K←2

Pk ⊐Pqa=P2⊐P7a=(ab⊐ababacaa) FALSE

K←1

Pk ⊐Pqa=P1⊐P7a=(a⊐ababacaa) TRUE

8.δ(q,a)←k
δ(7,a)←1

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0	0	a
5	1	4	6	c
6	7	0	0	a
7	1			

CONT...

2.q←7
3.for each character aϵb
K←8
Pk ⊐Pqa=P8⊐P7a=(ababacaa⊐ababacab)
FALSE
K←7
Pk ⊐Pqa=P7⊐P7a=(ababaca⊐ababacab) FALSE
K←6
Pk ⊐Pqa=P6⊐P7a=(ababac⊐ababacab) FALSE
K←5
Pk ⊐Pqa=P5⊐P7a=(ababa⊐ababacab) FALSE
K←4
Pk ⊐Pqa=P4⊐P7a=(abab⊐ababacab) FALSE
K←3
Pk ⊐Pqa=P3⊐P7a=(aba⊐ababacab) FALSE
K←2
Pk ⊐Pqa=P2⊐P7a=(ab⊐ababacab) TRUE

8.δ(q,a)←k
δ(7,b)←2

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0	0	a
5	1	4	6	c
6	7	0	0	a
7	1	2		

CONT...

2.q←7

3.for each character aϵc

K←8

Pk ⊐Pqa=P8⊐P7a=(ababacaa⊐abababacac) FALSE

K←7

Pk ⊐Pqa=P7⊐P7a=(abababaca⊐abababacac) FALSE

K←6

Pk ⊐Pqa=P6⊐P7a=(abababac⊐abababacac) FALSE

K←5

Pk ⊐Pqa=P5⊐P7a=(ababa⊐abababacac) FALSE

K←4

Pk ⊐Pqa=P4⊐P7a=(abab⊐abababacac) FALSE

K←3

Pk ⊐Pqa=P3⊐P7a=(aba⊐abababacac) FALSE

K←2

Pk ⊐Pqa=P2⊐P7a=(ab⊐abababacac) FALSE

K←1

Pk ⊐Pqa=P1⊐P7a=(a⊐abababacac) FALSE

K←0

Pk ⊐Pqa=P0⊐P7a=(ϵ⊐abababacac) TRUE

8.δ(q,a)←k

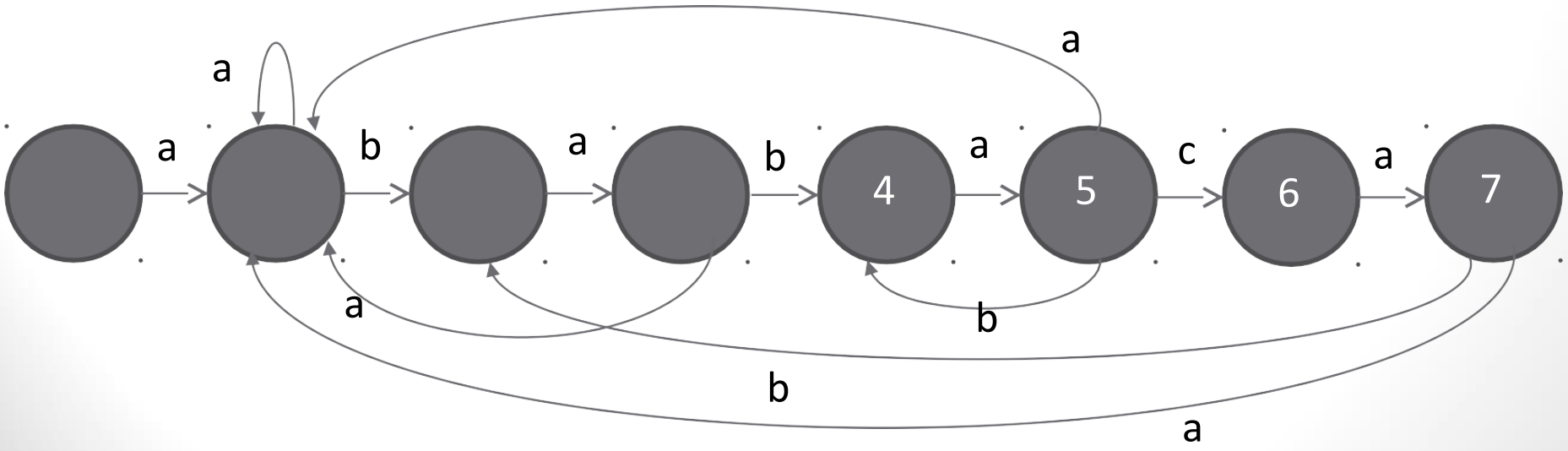
δ(7,c)←0

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0	0	a
5	1	4	6	c
6	7	0	0	a
7	1	2	0	

REQUIRED RESULT:

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0	0	a
5	1	4	6	c
6	7	0	0	a
7	1	2	0	

THE FINITE STATE AUTOMATA IS:



ALGORITHM…

FINITE AUTOMATON MATCHER

FINITE-AUTOMATON-MATCHER(T,δ,m)

1.n=T . length

2.q=0

3.**for** I =1 **to** n

4. q= δ(q, T[i])

5. **If** q==m

6. Print “Pattern occurs with shift” i -m

DRY RUNNING…

FINITE-AUTOMATON MATCHER

i= 1 2 3 4 5 6 7 8 9 10 11

T= a b a b a b a c a b a

1.n← length[T]

n←11

2. q←0

3. for i←1 to n

for i←1 to 11

1st ITERATION:

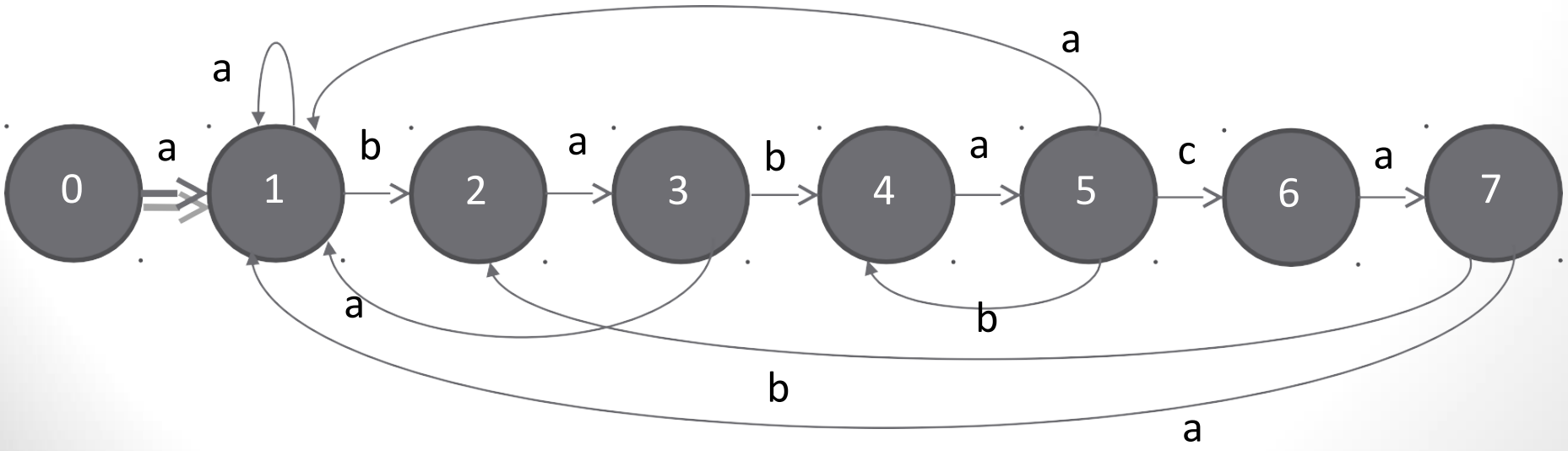
3. for i←1 to 11
4. do q←δ(q,T[i])

q←δ(0,T[1])=δ(0,a)

q←(0,a)=1

5. if q=m

if 1=7 FALSE



2ND ITERATION:

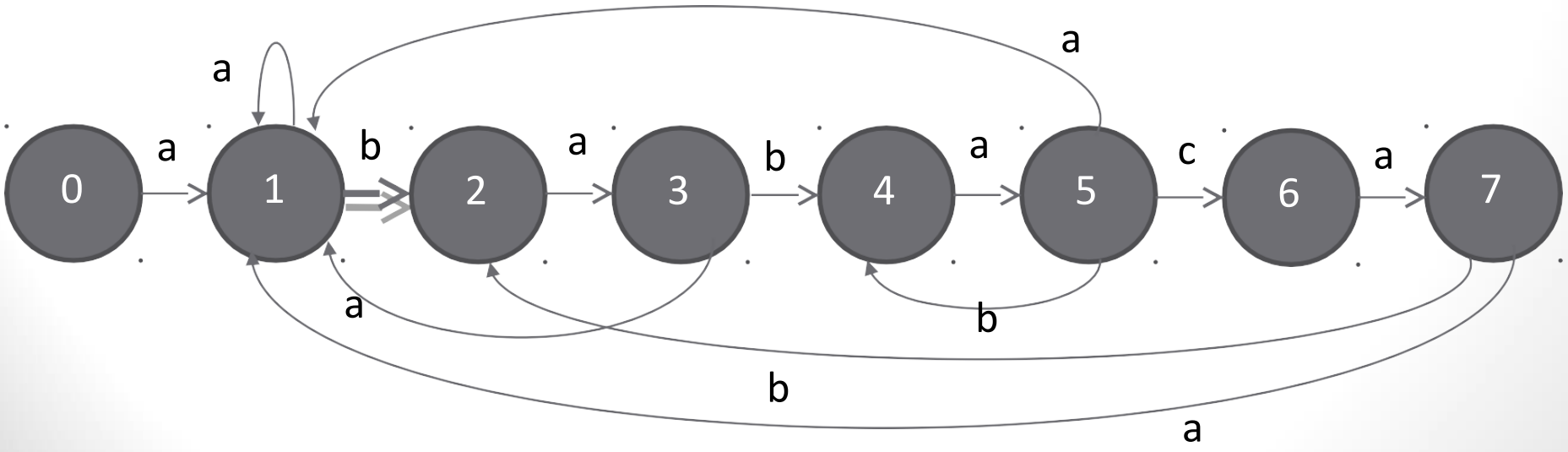
i=2,q=2

4. do q←δ(1,T[2])

=δ(1,b)

q←2

5 if 2=7 FALSE



3RD ITERATION:

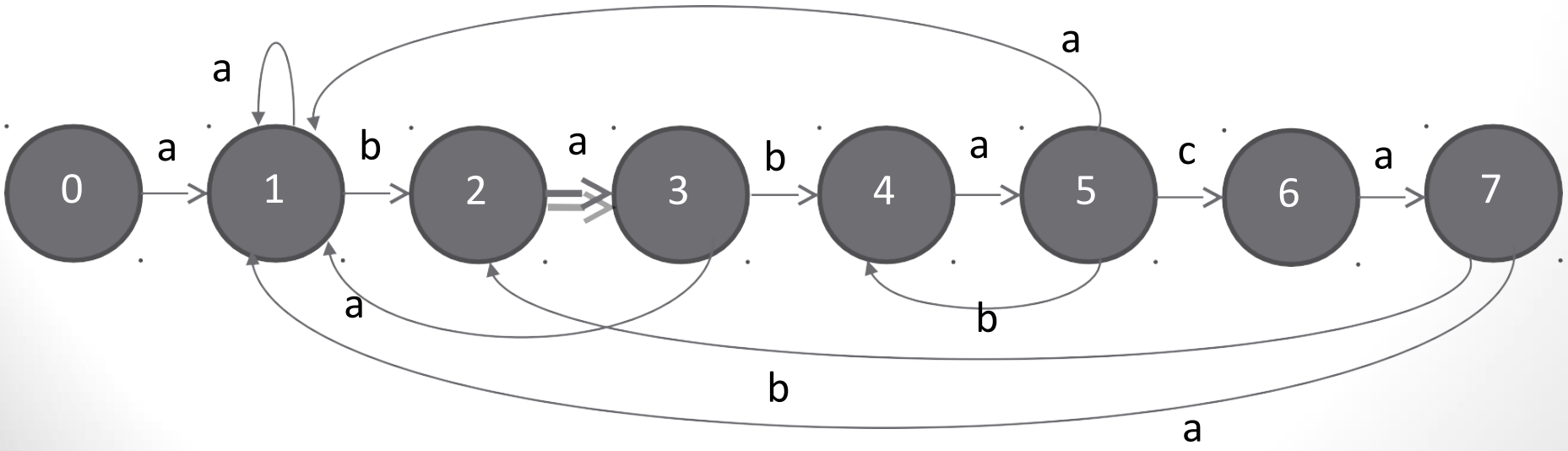
i=3,q=2

4. do q←δ(2,T[3])

=δ(2,a)

q←3

5 if 3=7 FALSE



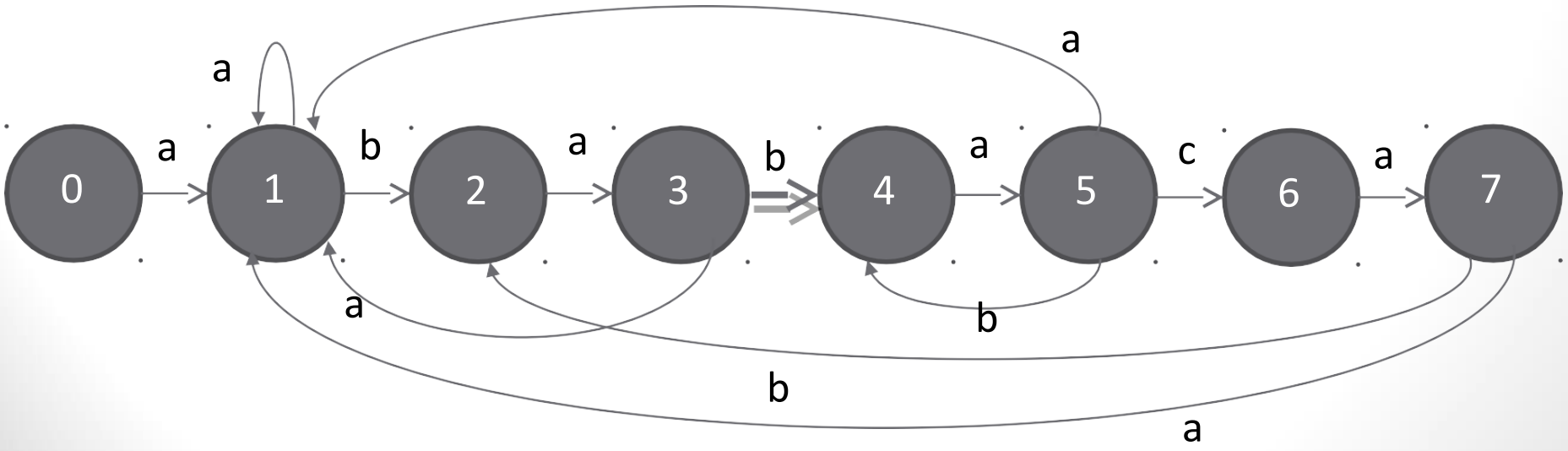
4th ITERATION:

i=4,q=3

4. do q←δ(3,T[4]) =δ(3,b)

q←4

5 if 4=7 FALSE



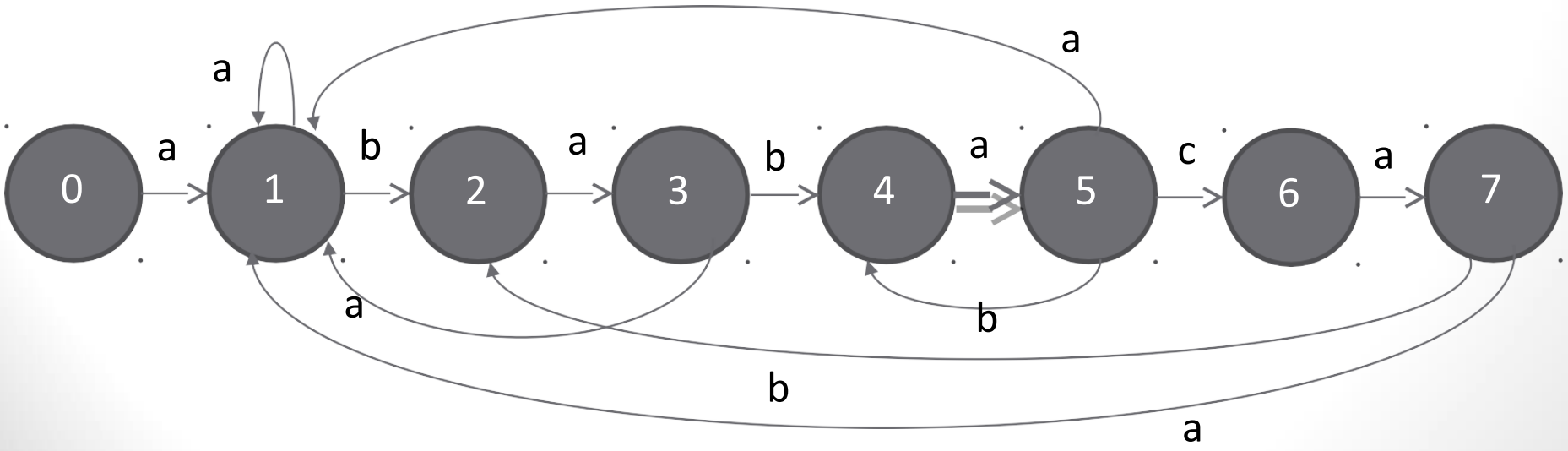
5th ITERATION:

i=5,q=4

4. do q←δ(4,T[5])
=δ(4,a)=5

q←5

5 if 5=7 FALSE



6TH ITERATION:

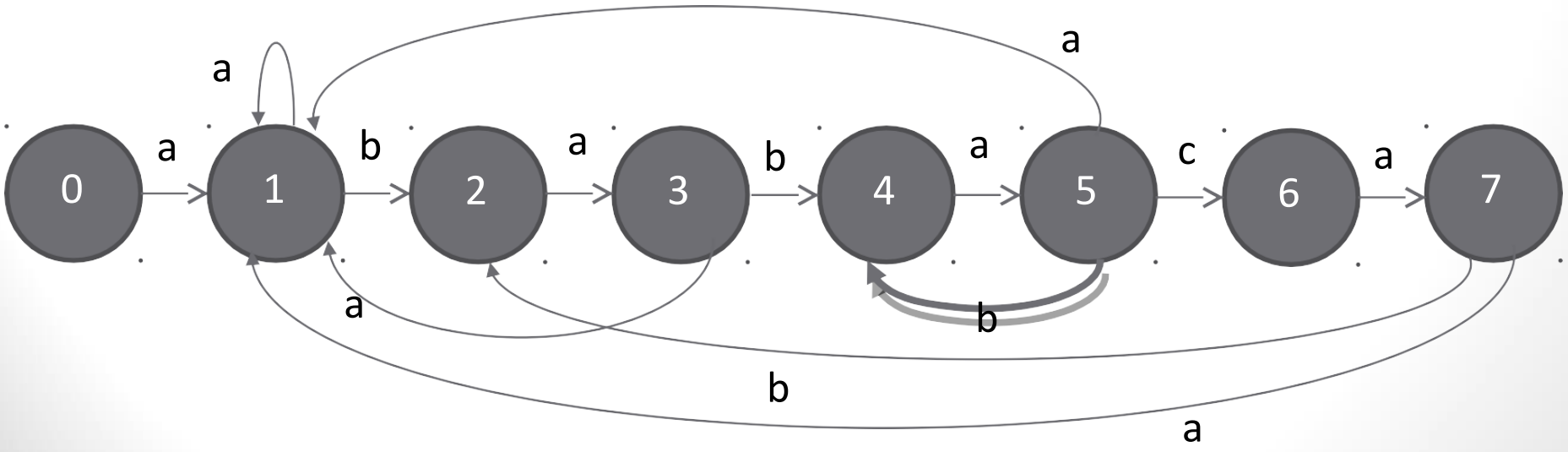
i=6,q=5

4. do q←δ(5,T[6])

=δ(5,b)=4

q←5

5 if 4=7 FALSE



7TH ITERATION:

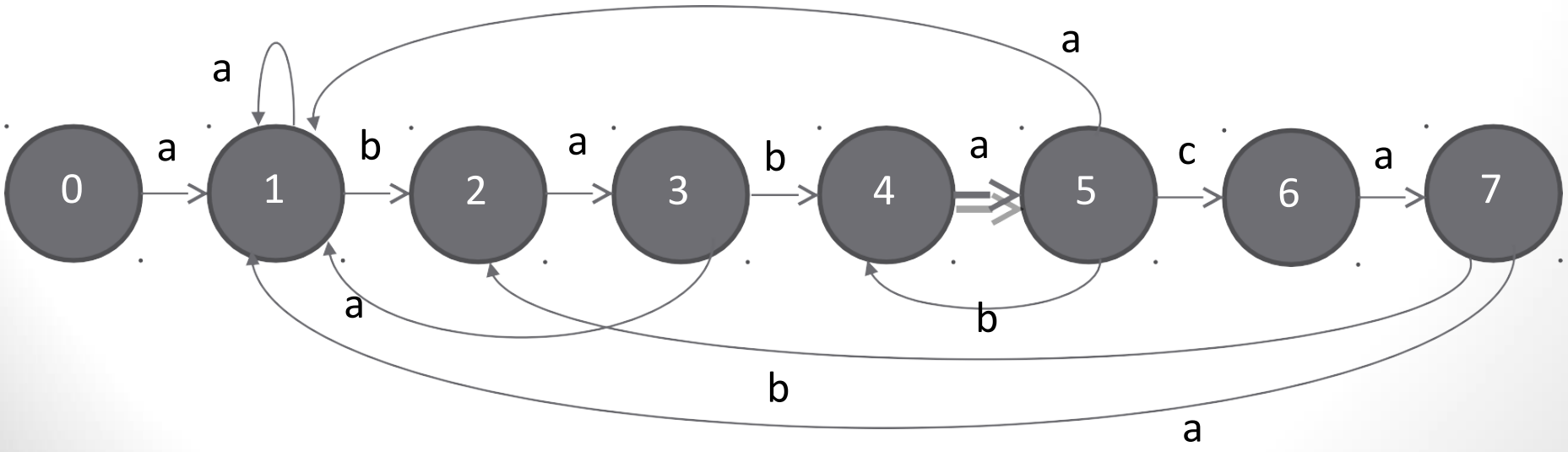
i=7,q=4

4. do q←δ(4,T[7])

=δ(4,a)=5

q←5

5 if 5=7 FALSE



8TH ITERATION:

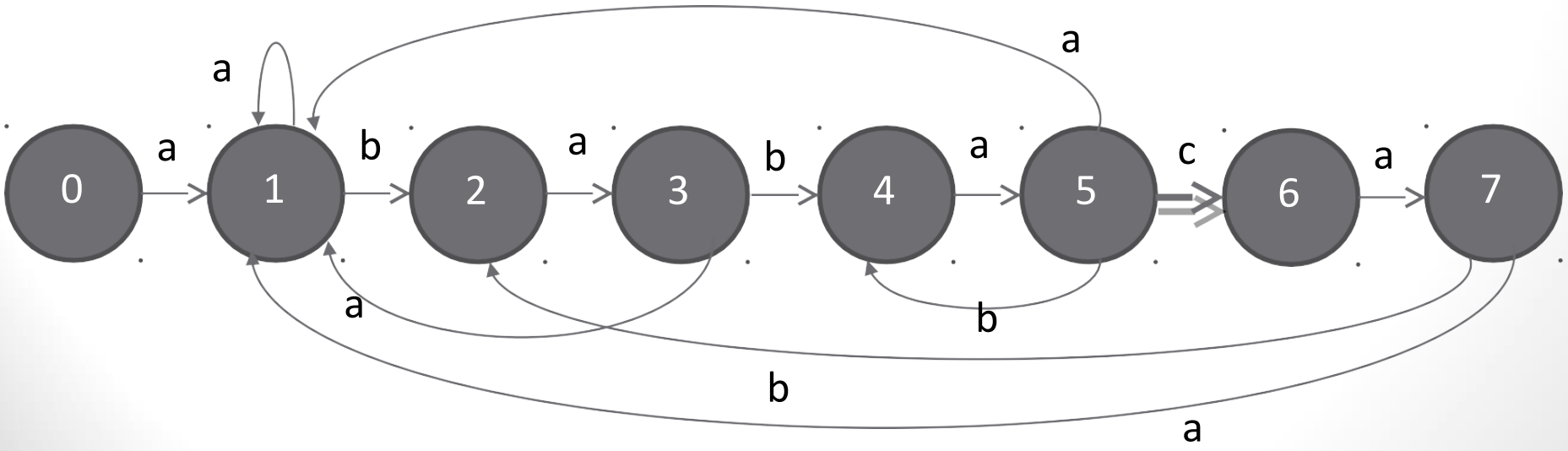
i=8,q=5

4. do q←δ(5,T[8])

=δ(5,c)=6

q←6

5 if 6=7 FALSE



9TH ITERATION:

i=9,q=6

4. do q←δ(6,T[9])

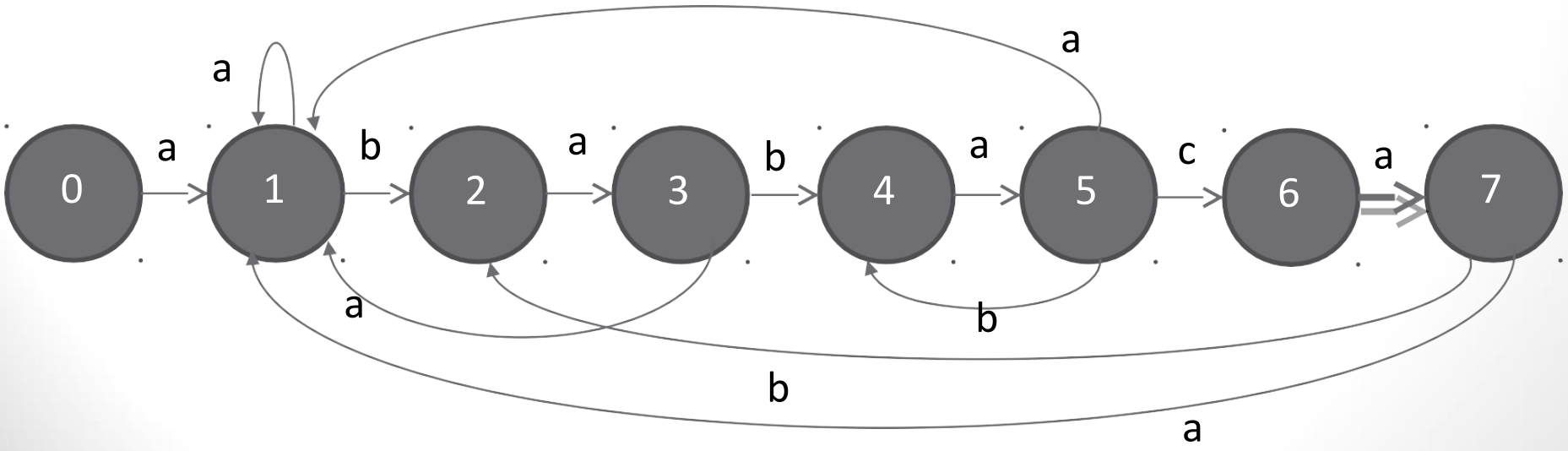
=δ(6,a)=7

q←7

5 if 7=7 TRUE

Then print "pattern occurs with shift"i-m

Print" pattern occurs with shift"9-7=2



10th ITEARTION:

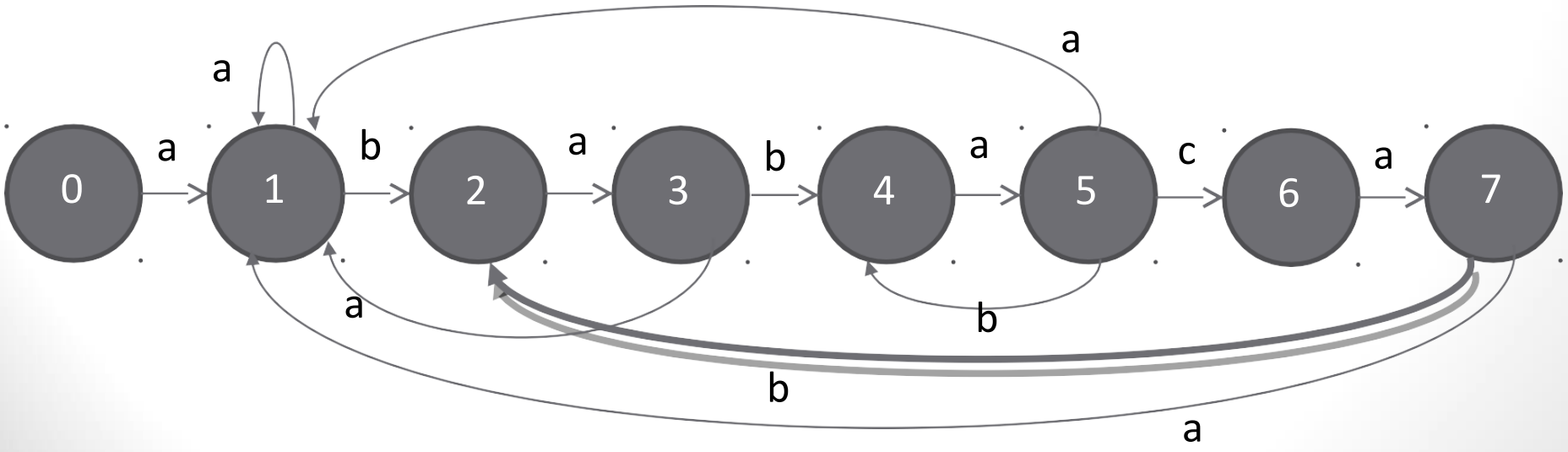
i=10,q=7

4. do q←δ(7,T[10])

=δ(7,b)=2

q←2

5 if 2=7 FALSE



11TH ITEARTION:

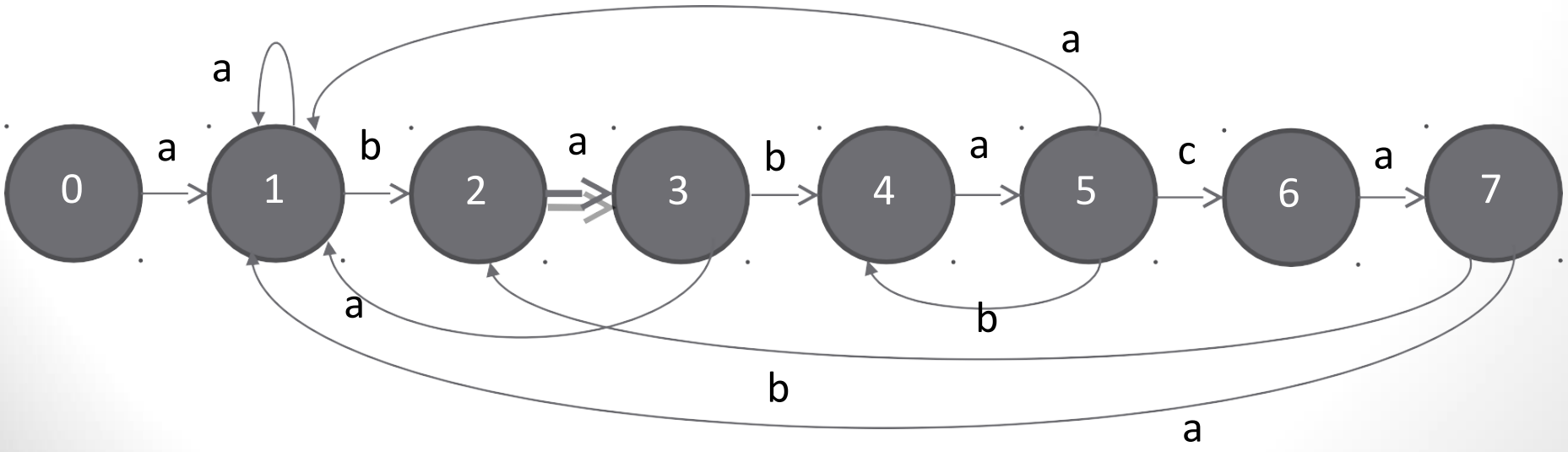
i=11,q=2

4. do

q←δ(2,T[11])=δ(2,a)=3

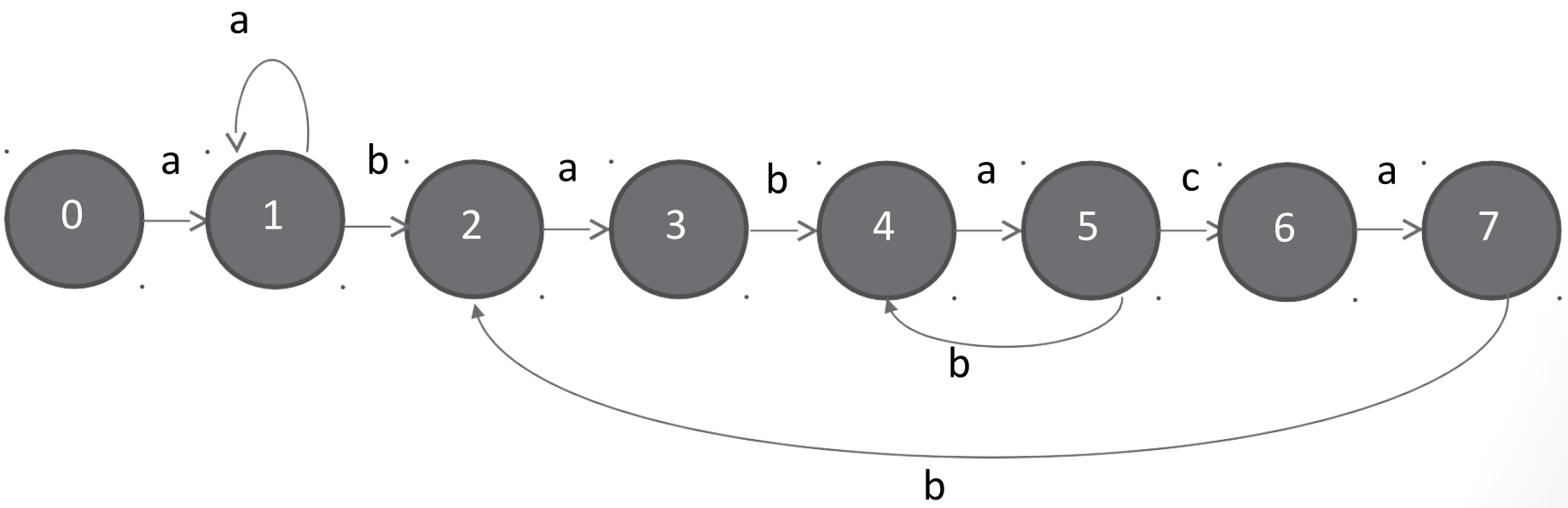
q←3

5 if 3=7 FALSE



REQUIRED OUTPUT:

After removing useless edges:



CONT..

i=	-	1	2	3	4	5	6	7	8	9	10
T[i]	-	a	b	a	b	a	b	a	c	a	b	a
state ΦT[i]	0	1	2	3	4	5	4	5	6	7	2	3

State	a	b	c	P
0	1	0	0	a
1	1	2	0	b
2	3	0	0	a
3	1	4	0	b
4	5	0	0	a
5	1	4	6	c
6	7	0	0	a
7	1	2	0	

COMPLEXITY…

COMPLEXITY ANALYSIS:

- The simple loop time of FINITE-AUTOMATON-MATCHER implies that its matching time on the text string of length is Θ(n).This matching time does not include the preprocessing time required to compute the transition function δ)
- The running time of COMPUTE-TRANSITION-FUNCTION is O(m^3 | ∑ |),because the outer loops contribute a factor of m | ∑ | ,the inner repeat loop can run atmost m+1 times, and the test Pk⊐ Pqa on line 7 can require computing upto m characters.
- Much faster procedures exist; the time required to compute δ from P can be improved to O(m | ∑ |)by utilizing some cleverly computed information about the pattern P. With this improved procedure for computing δ from P to O(m|Σ|), we can find all occurrences of a length-m pattern in a length-n text over an alphabet ∑ with O(m | ∑ |)preprocessing time and Θ(n) matching time.

ADVANTAGES & DISADVANTAGE…

ADVANTAGES & DISADVANTAGE:

- String matching automaton are very efficient
- Examine each text character exactly once taking constant time per text character.
- The time to build the automaton can be large if Σ is large